

2002 Annual Index

Volume 43



This instant reference of technical subjects, news, and special features from Volume 43 of *Sea Technology* magazine provides information about feature articles, covers, soapboxes, editorials and authors.

This listing will also appear on the *Sea Technology* website in the near future.
Check it out at www.sea-technology.com

JANUARY

Cover—The tragic events of September 11, 2001, resonated not only in the United States, but all over the world. *Sea Technology* is proud to display the American flag superimposed on an image of the sea on the cover of its Annual Review and Forecast issue, tying together two lasting symbols of patriotism and freedom.

Editorial—**EDUCATION: IT VARIES FROM OUTSTANDING TO LACKING**—by Martin J. Finerty Jr.

Soapbox—**ARE WE ADEQUATELY PREPARING STUDENTS FOR OCEAN OCCUPATIONS**—Deidre Sullivan

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Dr. Ronald C. Baird, Director, National Sea Grant College Program, NOAA

U.S. PROGRAM ON CLIMATE VARIABILITY AND PREDICTABILITY (CLIVAR)

Dr. David M. Legler, Director, U.S. CLIVAR Office

OIL & GAS INTERNATIONAL ACTIVITY PREPARES FOR MARKET REBOUND IN 2002

Susanne S. Pagano, Houston, Texas

AGIS: IN WAR & PEACE, AMERICA'S SHIELD AT SEA

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NEW PERSPECTIVES IN AMERICAN NAVAL SHIPBUILDING

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Lt. Gen. Robert Flowers, Commander, U.S. Army Corps of Engineers

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Congressman Wayne T. Gilchrest (R-Maryland), U.S. House of Representatives

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RAAdm. Richard D. West, Oceanographer of the Navy

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Dr. Charles G. Groat, Director, U.S. Geological Survey

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MINING INDUSTRY DURING 2001

Dr. Michael J. Cruickshank, Marine Minerals Technology Center Associates

FISHERIES & AQUACULTURE: PLENTY OF PRODUCT; POOR PRICES

Rick Martin, Publisher, *Commercial Fisheries News* and *Fish Farming News*

BETTER TIMES AHEAD FOR 2002

Alan D. Wilson, Managing Editor, *Sea Technology* magazine

FEBRUARY

Cover—SeaQuest multi-sensor gradiometer platform, deployed from the South African Navy mine hunter *Umhloti* in August 2001. SeaQuest, in this configuration, contains three sensors, an electronics bay, tilt sensor, altimeter and depth sensor. This unique gradiometer platform is ideal for UXO and small target detection because it can measure the complete 3D gradient vector quickly, accurately and in real time. (Photo credit: Melissa Marlowe, Marine Magnetics Corp.)

Editorial—**THE PRESIDENT, BUSINESS & THE ENVIRONMENT**—Alan D. Wilson

Soapbox—**A RENEWED NEED FOR SCIENCE EDUCATION REFORM**—Sarah Schoedinger

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Dr. K. Lebart, Dr. Y. Petillor, Dr. C. Smith, Dr. D. Lane and Dr. E. Trucco (Heriot-Watt University) discuss underwater survey video data.

NXIC SENSOR FOR DEPLOYMENT IN BIOLOGICALLY ACTIVE REGIONS

Alan J. Fougere, Robert H. Beede and Mary St. Germain (Falmouth Scientific Inc.) examine how the non-external field inductive conductivity concept capitalizes on the advantages of the inductive cell.

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—Conference Preview

ACOUSTIC THERMOMETRY TAKES ITS PLACE IN THE INDIAN OCEAN

Andrew Forbes (CSIRO Marine Research) and an international team of researchers find a new tool for basin-wide observation network.

OCEANOLOGY INTERNATIONAL 2002: 'THE LONDON EXPERIENCE'—Conference Preview

RESEARCH VESSEL DESIGN
Dr. Sathish Balasubramanian (Band, Lavis & Assoc. Inc.) talks about PASS using design synthesis modeling capabilities to include emerging technologies in synthesis models.

ASSATEAGUE & CHINCOTEAGUE: BEAUTY AND NATURE COMBINED

Alan D. Wilson (Managing Editor) reports on a national wildlife refuge.

OCEANS 2001 MTS/IEE—Conference Report

MARCH

Cover—At left is a collection of images from CARIS HIPS bathymetric and sonar data processing and production software. Here, gridded bathymetry data are displayed with a georeferenced aerial photograph and an S-57 Ed. 3.1 electronic navigation chart produced using CARIS HOM. Data was collected and processed by the NOAA ship *Whiting* in support of the Shallow Survey 2001 Conference and the Australian Defense Science and Technology Organization. (Photo courtesy of FreeStockPhotos.com)

Editorial—**WATKINS COMMISSION CHALLENGE**—Charles W. Covey

Soapbox—**SOFT SEDIMENTS IN NAVIGATION CHANNELS**—E. Clark McNair Jr. and Norman R. Francingues

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INLAND ELECTRONIC NAVIGATIONAL CHARTS IN THE USACE

Dr. Robert G. Mann (United States Army Engineer Research and Development Center) describes the necessity of providing the highest level of navigational data in a timely manner for the mariner on the inland waters.

STAND-ALONE REAL-TIME GPS POSITIONING WITHOUT SA

Reha Metin Alkan (Istanbul Technical University) explains how global positioning systems have become a global utility primarily used as a navigation system.

PROCESSING ADCP DATA FOR INSTATIONARY FLOW PATTERNS

V. Müller, D. Vorrath and H. Eden (Eden, Vorrath & Partner) introduce LOG_aFLOW, hydrodynamic software for hydraulic engineering and navigation.

NAVIGATION ENHANCEMENT FOR FAST PASSENGER FERRIES

David Clark (Golden Gate Bridge, Highway and Transportation District) talks about an affordable new tool for high-speed vessel masters.

A WATERWAY OF THINKING

Kevin Wilson (CARIS), D'Arcy McKenny (Canadian Coast Guard) and Capt. Jean-Luc Bédard (Montreal Port Authority) take a closer look at information management for the St. Lawrence River, Canada.

CHALLENGES IN EPA'S COASTAL AND OCEAN PROGRAMS

Suzanne E. Schwartz (Environmental Protection Agency) addresses a wide variety of significant environmental issues.

CANADIAN HYDROGRAPHIC CONFERENCE

2002—Conference Preview

PSSAs: IMO GUIDELINES

Kristina M. Gjerde (Environmental Investment Partners) discusses new IMO-adopted guidelines for identification and designation of particularly sensitive areas of the world's oceans.

APRIL

Cover—The *Chiles Discovery*, a KFELS Mod V-B design is the latest addition to the Chiles Offshore rig family. The *Chiles Discovery* will begin a 15-20 well development in Phillips Bayu Undan Gas Recycle project in the Timor Gap Zone of cooperation between Australia and East Timor in the second quarter of 2002.

Editorial—**FROM MORATORIA TO MANAGEMENT**—Tom Fry

Soapbox—**AN OCEANOGRAPHIC COMMITMENT TO HOMELAND SECURITY**—Dr. Richard W. Spinrad

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3D MODELING CUTS CAD TIME FOR NORTH SEA DRILLING SYSTEM

Ryall Fox (Rebis®) explains how this new modeling decreases CAD time for a drilling system by 50 percent, eliminating clashes completely.

MONITORING UNDERWATER JOBS USING VIRTUAL ENVIRONMENTS

Dr. A. Op den Bosch and Dr. J.C. Santamaria (XYZ Solutions Inc.) introduce remote visualization tools for underwater operations.

ANTICIPATED OIL, GAS SECTOR RECOVERY IN LATE 2002, EARLY 2003

Susanne S. Pagano (Houston, Texas) examines how U.S. Gulf deepwater drilling and production activity remains the market highlight.

OFFSHORE TECHNOLOGY CONFERENCE 2002—Conference Preview

OPERATIONAL OCEANOGRAPHY USING THE NEW SEASOAR UNDULATOR

J. Allen, V. Cornell, C. M. Moore, N. Crisp (Southampton Oceanography Centre) and J. Dunning (Chelsea Technologies Group) talk about a new instrument designed to handle real-time data from multiple instruments.

WEB MODEL ESTIMATES OYSTER PARASITE TIME-TO-CRITICAL LEVELS

Dr. Enrique V. Kortright (Kortright Corp.), Dr. Thomas M. Soniat (Nicholls State University) and Dr. Sammy M. Ray (Texas A&M University) observe how the Sea Grant project helps traditional fishery management oyster stocks.

NOIA 2002—Conference Report

METS - THE TOOL FOR PIPELINE INSPECTION
Daniel Esser (CAPSUM Technologie GmbH) discusses why previous leak detection methods have been unsatisfying.

BEAT THE SEA WITH FRP (PUMPS, THAT IS)

Ted Beck (Met-Pro Corp.) weighs fiberglass-reinforced plastic pumps over exotic metal ones.

MAY

Cover—Both close up and far away views of the SeaTel antenna radome mounted on the R/V *Roger Revelle*. The research vessel is 273 feet 8 inches in length and was launched in 1996. It supports a scientific crew of 32 people.

Editorial—**PAST, PRESENT, FUTURE OF COMMUNICATIONS**—VAdm. Conrad C. Lautenbacher Jr.

Soapbox—**INDUSTRY'S ROLE IN AN INTEGRATED OCEAN OBSERVING SYSTEM**—Dr. Andrew M. Clark

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HIGH SEAS ROADNet: INTERNET AT SEA FOR OCEANOGRAPHIC RESEARCH

Dr. Jonathan Berger and Dr. John Orcutt (Scripps Institution of Oceanography) discuss delivery of large quantities of underway data to shore for quality control, archiving and real-time data availability.

REMOTE SENSING AND ACOUSTIC TELEMETRY

Dale Green (Benthos Inc.) and Prof. Truong Nguyen (University of California, San Diego) examine how undersea telemetry can be combined with novel image compression to provide transport of images over long distances.

EFFICIENT AUTOMATED SONAR IMAGE PROCESSING TOOLS

Dr. S. Guillaudeux and Dr. D. Charlot (Triton Elics International) take a look at how classical image processing tools abet automated object detection, seafloor classification and patch tests in TEI products for use with large data sets.

IN THE ATLANTIC, DECADEAL CLIMATE VARIABILITY, PREDICTABILITY

Richard F. Burns (Associate Editor) observes North Atlantic oscillation; decadal variability in tropical and extra-tropical Atlantic; South Atlantic variability; and ongoing and planned research.

OI 2002—Conference Report

UI 2002—Conference Report

OPTICAL BUOY VERIFIES OCEAN COLOR DATA

Leslie Doyle (The MathWorks) discusses how Moss Landing uses optical buoy to verify accuracy of ocean color data provided via satellite instruments.

JUNE

Cover—Dual Reson 8125 data collected by a joint effort between SAIC and Reson International as part of the Portsmouth Harbor Common Data Set, in support of Shallow Survey 2001 (Portsmouth, New Hampshire). The visualization of a multi-resolution tile surface was generated by Helical Systems' HHViewer from a Self Defining Structure file. The data was tiled using Helical Systems' HHTile application, reducing the number of records by 100:1, while maintaining all the fine detail.

Editorial—MULTI-MISSION SURVEY

ADVANCES DATA COLLECTION—Capt. Tim McGee

Soapbox—**THE OPPORTUNITIES OF NEW SEAFLOOR MAPPING TECHNOLOGY**—RAdm. Evelyn J. Fields

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FORWARD-LOOKING SONAR DESIGN ALTERNATIVES

Dr. Chester D. Loggins (Sonatech Inc.) discusses how diverse performance requirements lead to a wide variety of design approaches.

USNA-1: A MINIATURE, LOW-COST AUTONOMOUS UNDERWATER VEHICLE

Dr. Carl E. Wick (U.S. Naval Academy) and Dr. Daniel J. Stilwell (Virginia Polytechnic Institute) examine how this vessel is designed for navigation, sensor and AUV employment research.

AIRBORNE LIDAR HYDROGRAPHY: A VISION FOR TOMORROW

W. Jeff Lillycrop, Jennifer M. Wozencraft (USACE) and Robert W. Pope (Naval Oceanographic Office) focus on regional seafloor mapping.

THIRD BIENNIAL OCEAN TECHNOLOGY WORKSHOP—Conference Preview

MULTIBEAM SURVEYS - A MAJOR TOOL FOR GEOSCIENCES

Jacques Locat (Université Laval) and Richard Sanfaçon (Canadian Hydrographic Service) observe how the current quality of multibeam surveys makes them key in any underwater study.

NOR-50: FAST RESEARCH VESSEL FOR OPERATIONAL OCEANOGRAPHY

Philippe Marchand (IFREMER) and Dr. Jacques Servain (IRD) examine how to implement PIRATA & Argo programs in the Atlantic in a practical way.

MAPPING WITH MULTIBEAM DATA: ARE THERE IDEAL MODEL SETTINGS?

Tom Vande Wiele (University of Ghent) explains how through many factors, the lowest RSME model is attained.

INTELLIGENT REDUCTION OF SWEEP SURVEY/LIDAR LARGE DATA SETS

Michael Grounds (Beacon Resources) shows how intelligent thinning reduces data volume without sacrificing modeling accuracy.

TELEMETRY FOR EARLY WARNING OF RED TIDES

I.H.Y. Lam and Prof. John Hodgkiss (University of Hong Kong) introduce a novel approach for red tide studies, providing *in-situ*, real-time measurement.

JULY

Cover—SEACON Phoenix hull penetrator undergoes underwater explosive (UNDEX) testing off the coast of Rosyth, Scotland. (Photo credit: Bill Mildon)

Editorial—NEEDED: BOLD FEDERAL INVESTMENT IN OCEANS—Richard J. Herman

Soapbox—KNOW THE ROPES: COMMODITY OR QUALITY—John Flory

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SEACON PHOENIX/BAE SYSTEMS TEAM

Michael Mulcahy (Michael Mulcahy & Assoc. Inc.) discusses how international collaboration achieves reliability and economy in U.K. *Astute*-class submarine connectors.

LOW POWER/HIGH PERFORMANCE ACTIVE HEAVE COMPENSATION

Jeffrey D. Haney, Dean W. Carey and Q. Zane Rhodes II (Dynacon Inc.) examine the development of a robust active heave compensation system that uses 10 HP per compensated tonne.

FISCAL YEAR 2003 FEDERAL BUDGET NOTES

Richard F. Burns (Associate Editor) focuses on the funding transfers to improve quality, competition for research, facility up-grades and agency interaction that mark the budget.

COMPUTER-AIDED DESIGN OF CABLES FOR OPTIMAL PERFORMANCE

Dr. R.H. Knapp (University of Hawaii at Manoa),

S. Das and T.A. Shimabukuro (Structural Solutions) explain the use of geometric modeling and finite element software for structural design of cables.

ACTIVE CONTROL IN WAVE ENERGY CONVERSION

Umesh Korde (St. Cloud State University) discusses a brief survey of methods that could reduce the cost of harnessing the ocean's power.

AUGUST

Cover—Artist's conception of an observatory site in a mid-ocean ridge crest setting, where the spectrum of deep submergence vehicles are used to deploy and service seafloor instrumentation and conduct experiments. (Artist: E. Paul Oberlander, Woods Hole Oceanographic Institution)

Editorial—OCEAN EXPLORATION: EXPLORING-IN-TIME—Dr. Margaret Leinen

Soapbox—MARINE SCIENCE EDUCATION NEEDS TO FOCUS ON THE CUSTOMER—Frank W. Hughes

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CONTINUOUS OCEAN PRESENCE FOR SCIENTIFIC RESEARCH

Dr. H. Lawrence Clark (National Science Foundation) discusses how NSF observatories measure and assess timing of events and links between Earth's physical, chemical and biological systems.

UNCLOS ARTICLE 76 SURVEYS: CLAIMS FOR EXTENDED BOUNDARIES

Dr. Jerry C. Wilson (Thales GeoSolutions Pacific Inc.) examines how marine geodesists, geologists and geophysicists depend on a suite of state-of-the-art systems for UNCLOS surveying.

THE NATIONAL SCIENCE FOUNDATION'S RIDGE 2000 PROGRAM

Chairman Charles Fisher and the Ridge 2000 Steering Committee explain the use of time-series experiments and innovative technology to study mid-ocean ridge processes.

SEG 2002—Conference Preview

PORTS, COASTLINE AND WATERWAYS SECURITY NOTES

Richard F. Burns (Associate Editor) describes post-September 11 Coast Guard actions; funding for increased security; future enhancements; and the magnitude of the task.

STEREOVISION IMAGING TO MAP SEAFLOOR AND BENTHIC HABITATS

Dr. Shahriar Negahdaripour, Hossein Madjidi (University of Miami) and Dr. Ali Khamene (Siemens Corporate Research) detail a promising technology that goes from 2D to 3D subsea mapping.

ULTRA-HIGH RESOLUTION SEABED MAPPING USING AN AUV

Dr. Ian Stevenson, Paul Nicholson, Annitta Attieh and Clayton Summers (De Beers Marine) present a case study from the offshore diamond mining industry.

PROMOTING DREDGED MATERIAL AS A RESOURCE

Laura Johnson Sabat, Craig Vogt

(Environmental Protection Agency) and Barry Holliday (Army Corps of Engineers) explain why dredged material is a valuable resource that can be used in environmentally beneficial ways.

SEPTEMBER

Cover—Image created in terramodel of LADS Mk II data in the approach to Ireland's Westport. Image features drowned drumlins of glacial origin.

Editorial—ADDRESSING COASTAL POLLUTION: LET'S GET IT RIGHT—Dr. Dan Walker

Soapbox—HUMANS AND THE COAST: WHAT FUTURE WILL WE CREATE?—Jerry R. Schubel

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ELECTROMAGNETIC SENSOR MEASURES WATER LEVEL

Dr. Øistein Grønlie (Miroslav A/S) introduces a simple and inexpensive system that provides high-quality data and is also suitable for a wide range of other applications.

SEAWEED: USED FOR EVERYTHING FROM FERTILIZER TO FOOD

Bernard Banga (Technical Freelance Writer) examines how the research and applications for marine plants in France are constantly increasing.

DESALINATION: AN AFFORDABLE AND ENVIRONMENTALLY FRIENDLY OPTION

Richard Burns (Associate Editor) discusses ocean water desalination for fresh water uses.

RD INSTRUMENTS—Company Profile

OCEANS 2002—Conference Preview

MARITIME CULTURAL ARTIFACT EXPLORATION AND UNCLOS

Bob Thomas, Lorin Pruett, Dr. Harold Palmer and Joe Cimino (Veridian Corp.) explain a GIS approach to evaluating U.N. Convention on the Law of the Sea and environmental impacts on search and recovery efforts.

AIRBORNE LASER SURVEYS FOR RESOURCES DEVELOPMENT

Mark Sinclair (Tenix LADS Corp. Pty. Ltd.) observes how a recent six-month global survey campaign demonstrates the flexibility of airborne laser survey for resource development.

LIMPET WAVE-POWER STATION: POWER QUALITY ASSESSMENT

Dr. R.G. Alcorn and Dr. W.C. Beattie (The Queen's University of Belfast) explain how software compliant with IEC standards was developed to determine flicker, and how the impact of electrical grid was successfully employed. **THE ELECTRONIC ACTIVATED PELICAN HOOK** George M. White and Rex Johnson (University of Washington) describe a release mechanism for deployment of underwater instrumentation and other marine packages.

OCTOBER

Cover—As part of the European Union-funded MAMA (Mediterranean Network to Access and Upgrade Oceanographic Monitoring Activities) Initiative, EDT's DP vessel M/V EAS and the Micoperi 30 barge prepare MedGOOS-2 for deployment in the eastern Mediterranean, off the southern coast of Cyprus. One of Harris Maritime Communication Services' (MCS)

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OceanNET™ environmental monitoring buoys (MedGOOS-1) is already deployed in the western Mediterranean, off the coast of Sardinia. (Photo courtesy of J. Rice—Harris MCS)
Editorial—WOCE AND THE OCEAN OBSERVATION REVOLUTION—Dr. John Gould
Soapbox—IT IS TIME FOR THE UNITED STATES TO SUPPORT SUSTAINABLE WHALING—Joji Morishita

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MEPS: A PROTOTYPE FOR THE STUDY OF COASTAL DYNAMICS

Andrew Safer (Freelance Writer) describes how mooring systems provided in-depth profiles of a historic bay for marine users and scientists.

UPPER-LAYER OCEAN CURRENT FORECASTS
Dr. Xavier Vigan (SAT-OCEAN) discusses the use of satellite imagery and how forecasting upper-layer ocean currents abets oil and gas exploration.

REMOTE SENSING AND MULTIBEAM HYDROGRAPHY

Timothy A. Kearns (Nova Scotia Community College) examines the similarities in the characteristics and techniques applied to LiDAR, SAR and MBES data.

EVALUATION OF SEAWIFS OPTICAL PRODUCTS IN COASTAL REGIONS

S. Ladner (Planning Systems Inc.), R.A. Arnone, Dr. R.W. Gould Jr. (Naval Research Laboratory) and P.M. Martinolich (Neptune Sciences Inc.) explain how *in-situ* optical absorption and scattering measurements are used to develop and validate satellite algorithms.

CONTINUOUS RADON-222 MEASUREMENTS IN THE COASTAL ZONE

Derek K. Lane-Smith (Durrig Co. Inc.), William C. Burnett and Henrieta Dulaiova (Florida State University) describe how better time resolution and higher sensitivity from new technologies are applied to solving old problems.

GOOS PROJECT UPDATE: IMPLEMENTATION PROGRESS

Dr. Colin Summerhayes (Intergovernmental Oceanographic Commission) details the Global Ocean Observing System and how it is helping to instrument Earth's surface and extending deeper into our understanding of the oceans.

CONTINUOUS MEASUREMENTS OF SUSPENDED MATTER

Dr. D.K. Mills, J.M. Rees (Centre for Environment, Fisheries and Aquaculture Science), Dr. M. Rutgers van der Loeff and Dr. R.W.P.M. Laane (National Institute for Coastal and Marine Management) discuss water quality and load concentration monitoring in the Dutch coastal zone using the SmartBuoy.

NOVEMBER

Cover—Crewmen on the USS *Boise* (SSN 764) stand by to receive a package being lowered to them on a rescue hoist from an SH-60F Seahawk assigned to Helicopter Antisubmarine Squadron Five (HS-5). HS-5 is attached to Carrier Air Wing Seven (CVW-8), aboard USS *John F. Kennedy* (CV 67). (Photo courtesy of U.S. Navy)

Editorial—THE 'TRANSFORMATION' OF THE SUBMARINE FORCE—Capt. James H. Patton Jr.
Soapbox—WAKE-UP CALL FOR NATIONAL DEFENSE—Ben J. Korgen

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ACOUSTICAL IMAGING SENSORS FOR MINE COUNTERMEASURES

Andy Pederson, Bruce Johnson (Naval Explosive Ordnance Disposal Technology Division), Houston Jones (Naval Space and Warfare Systems, San Diego) and R. Lee Thompson (Applied Physics Laboratory, University of Washington) discuss high-resolution imaging for the identification of underwater objects.

SEA SLICE DEMONSTRATES MULTI-MISSION FLEXIBILITY

Richard F. Burns (Associate Editor) tells of a high-speed vessel that participated in a major experiment on the U.S. West Coast to prove new technology.

VISUALIZATION AIDS FOR NAVY SONAR SYSTEMS AND AT-SEA TEST RANGES

Robert J. Barton III (Naval Undersea Warfare Center) examines exploiting harmonic and periodic structures for environmental compliance applications.

CYMBAL AND BB FLAT PANEL AND CONFORMAL SONAR ARRAYS

Dr. Robert E. Newnham, Dr. W. Jack Hughes, Douglas C. Markley, Dr. Richard J. Meyer Jr. (The Pennsylvania State University), Dr. Sedat Alkoy (Gebze Institute of Technology), Dr. Anne-Christine Hladky-Hennion (ISEN) and Dr. Jindong Zhang (Crest Ultrasonics) explain how miniaturized versions of flexensional transducers and hollow spheres were developed for future naval and biomedical capabilities.

ACOUSTIC LEAK DETECTION FOR UNDERWATER OIL AND GAS PIPELINES

Alessandro Barbagelata and Luigi Barbagelata (Co.L.Mar.) outline the methodology and field experiences behind an unconventional acoustic system designed to overcome the limits of traditional leak detection techniques.

AN ICE-PENETRATING COMMUNICATION BUOY

Dr. Peter Stein, Douglas Andersen and Armen Bahlavouni (Scientific Solutions Inc.) introduce a communication device for underwater vehicles operating in the Arctic.

DECEMBER

Cover—The *Global Explorer* highly mobile ROV being launched from a Canadian Coast Guard ice breaker in the high Arctic region of the Beaufort Sea. *Global Explorer* assisted NOAA in deep water Arctic exploration and science in the deep Canada Basin.

Editorial—GEOSPATIAL DATA NEEDS FOR THE NEXT CENTURY

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Soapbox—FUTURE DEEP SUBMERGENCE PLATFORMS: GOING THERE AND STAYING THERE—Dr. Don Walsh

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FIRST EYES IN THE HIDDEN ICY ABYSS

Ralph B. White (Freelance Writer) details how a multinational team of scientists explored Canada's remote Arctic basin and studied the possible effects of global warming.

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NEW RESEARCH CHALLENGES IN CANADA'S ARCTIC

Dr. Garry J. Heard, Mike Vinnins, Janice Lang (Defence R&D Canada) and Dr. Stan E. Dosso (University of Victoria) describe an innovative approach to research in under-ice surveillance technologies and how they help to protect Canada's Arctic waters.

METABOLIC SIMULATOR SUPPORTS DIVING APPARATUS RESEARCH

Cmdr. Ryszard Klos (Naval University of Gdynia) tells of a mathematical model of semiclosed circuit diving apparatus ventilation validated by metabolic/breathing simulator.

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